

**UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA**

REGENTS OF THE UNIVERSITY OF
MINNESOTA,

Plaintiff,

v.

AT&T MOBILITY LLC,

Defendant

Civil No. 14-4666 (JRT/TNL)

ERICSSON, INC., AND NOKIA OF AMERICA
CORP.,

Intervenor- Defendants

REGENTS OF THE UNIVERSITY OF
MINNESOTA,

Plaintiff,

v.

SPRINT SOLUTIONS, INC. AND SPRINT
SPECTRUM L.P.,

Defendants,

Civil No. 14-4669 (JRT/TNL)

ERICSSON, INC., NOKIA OF AMERICA
CORP., AND NOKIA SOLUTIONS AND
NETWORKS US LLC,

Intervenor- Defendants

REGENTS OF THE UNIVERSITY OF
MINNESOTA,

Plaintiff,

v.

T-MOBILE USA, INC.,

Defendant,

Civil No. 14-4671 (JRT/TNL)

ERICSSON, INC., NOKIA OF AMERICA
CORP., AND NOKIA SOLUTIONS AND
NETWORKS US LLC,

Intervenor- Defendants

REGENTS OF THE UNIVERSITY OF
MINNESOTA,

Plaintiff,

v.

CELLCO PARTNERSHIP D/B/A VERIZON
WIRELESS,

Civil No. 14-4672 (JRT/TNL)

Defendant,

ERICSSON, INC., ALCATEL-LUCENT USA
INC., AND NOKIA OF AMERICA CORP.,

Intervenor- Defendants

MEMORANDUM OPINION AND ORDER ON MOTIONS FOR SUMMARY JUDGMENT

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Plaintiff Regents of the University of Minnesota (“Regents”) filed this action against Defendant cellular network companies (“Defendants”), claiming infringement of various patents related to cellular data transmission technology. The parties have filed four separate motions for summary judgment, many of which contain multiple discrete issues. The Court will hold that the Ming PCT patent is not prior art but nonetheless allow Defendants to rely on the Ming US application for their prior art arguments. As to the original patent dispute, the Court will conclude that even though the rule applies to narrowing reissues, the ’230 patent complies with the rule. The Court will deny all of Defendants’ motions for summary judgment of non-infringement because there are genuine disputes of material facts. And finally, the Court will deny Defendants’ allegations of unenforceability because Defendants do not meet the high bar to prove inequitable conduct. Accordingly, the action may proceed.

BACKGROUND

I. FACTS

This action involves three groups of patents. The ’768 and ’230 patents improve the efficiency and accuracy of cellular data transmission through error control coding, interleaving, mapping, and precoding. (See Mem. Op. & Order Construing Claim Terms (“Claim Construction”) at 6–8, Aug. 5, 2022, Docket No. 342.)¹ The ’317 patent family

¹ All docket numbers in this Order correspond to ECF No. 14-4666.

trains cellular receivers to correct for suboptimal conditions, including with null subcarriers. (*Id.* at 8–9.)

The general factual background was explained extensively in the Court’s Claim Construction Order. (*See id.* at 4–9.) Because the various motions for summary judgment address disparate issues, the Court will provide specific background for individual issues in the respective discussion sections.

II. PROCEDURAL HISTORY

In 2014, Regents filed a Complaint against Defendant cellular network companies asserting claims of direct and indirect infringement and willful blindness. (*See* Am. Compl., Jan. 30, 2015, Docket No. 25.) On Defendants’ motion, the Court dismissed Regents’ willful blindness claims. (Mem. Op. & Order on Mots. Dismiss, Sept. 29, 2015, Docket No. 45.) Ericsson, Inc. and Nokia of America Corp. intervened as defendants. (*See* Order, Mar. 30, 2016, Docket No. 131; Order, Mar. 31, 2016, Docket No. 136.) In 2017, the Court granted a motion for a limited stay pending a decision on inter partes review from the United States Patent and Trademark Office (“USPTO”). (*See, e.g.*, Order, May 19, 2017, Docket No. 237.) That stay was lifted in 2020, at which time the Court heard and decided claim construction arguments. (*See* Claim Construction.) Some construction terms were later amended pursuant to party stipulation. (Order Amending Construction of Claim Terms, Dec. 9, 2022, Docket No. 385.)

The parties have now filed four separate motions for summary judgment on the topics of prior art, the original patent rule, non-infringement, and inequitable conduct.

(See Pl.’s Mots. Summ. J., June 1, 2023, Docket No. 536; Defs.’ Mot. Summ. J., June 1, 2023, Docket No. 543; Def.’s Mot. Summ. J., June 1, 2023, Docket No. 580; Def.’s Mot. Summ. J., June 1, 2023, Docket No. 586.) Regents’ motions are nondispositive, requesting resolution of two anticipated defenses. Defendants’ motions, on the contrary, would dispose of the action if granted in various combinations.

DISCUSSION

I. STANDARD OF REVIEW

Summary judgment is appropriate when there are no genuine issues of material fact and the moving party can demonstrate that it is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a). A fact is material if it might affect the outcome of the lawsuit, and a dispute is genuine if the evidence could lead a reasonable jury to return a verdict for either party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). A court considering a motion for summary judgment must view the facts in the light most favorable to the nonmoving party and give that party the benefit of all reasonable inferences to be drawn from those facts. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 587 (1986).

Summary judgment is appropriate if the nonmoving party “fails to make a showing sufficient to establish the existence of an element essential to that party’s case, and on which that party will bear the burden of proof at trial.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986). “To defeat a motion for summary judgment, a party may not rest upon allegations, but must produce probative evidence sufficient to demonstrate a genuine

issue [of material fact] for trial.” *Davenport v. Univ. of Ark. Bd. of Trs.*, 553 F.3d 1110, 1113 (8th Cir. 2009).

II. MING AND PRIOR ART

Regents first move for summary judgment that Patent Cooperation Treaty application WO 03/085875 (“Ming PCT”) is not prior art. Defendants’ invalidity expert, Dr. Stephen B. Wicker, opines that Ming PCT is prior art to the ’230 and ’768 patents. But Regents argue that the Ming PCT application did not check the required boxes (quite literally) for an international patent application to serve as prior art. Thus, Defendants should be precluded, as a matter of law, from arguing invalidity based on Ming PCT.

Because Ming PCT did not “designate” the United States, the Court will grant Regents’ Motion for Summary Judgment and hold that Ming PCT is not prior art to the ’230 and ’768 patents as a matter of law. Nonetheless, the Court will allow Dr. Wicker to base his prior art arguments on the Ming US patent because such substitution would substantially comply with the Court’s invalidity disclosure deadlines and would not unfairly prejudice Regents.²

A. Background

Defendants’ expert asserts that Ming PCT is prior art that undermines the validity of the ’230 and ’768 patents. (See, e.g., Decl. of Conrad A. Gosen Supp. Pl.’s Mots. Summ.

² As will be discussed later in this Order, the Court will allow Regents similar flexibility to assert a non-timely infringement theory.

J. (“Gosen Ming Decl.”) ¶ 2, Ex. 1 (“Wicker Rpt.”) ¶¶ 249–51, June 1, 2023, Docket No. 539). The ’230 and ’768 patents each trace their priority dates to five provisional applications filed on April 22, 2002. (*Id.* ¶¶ 195–96.) Ming PCT, in turn, traces priority to Ming US, filed April 5, 2002. (*Id.* ¶ 249.) Ming PCT’s priority date precedes the ’230 and ’768 priority dates, so it may conceivably serve as prior art.

Pursuant to Court deadlines, Defendants supplied Regents with several batches of proposed invalidity arguments. (*See, e.g.*, Decl. of Conrad A. Gosen Supp. Pl.’s Reply Supp. Mot. Summ. J. (“Gosen Ming Reply Decl.”) ¶ 6, Ex. E, Aug. 10, 2023, Docket No. 687.) Defendants contested the validity of the ’230 and ’768 patents based on the Ming PCT application, not the Ming US application. (*E.g.*, Wicker Rpt. ¶ 249.) The time to raise new invalidity defenses has now passed.

B. Analysis

“[A] patent is presumed valid, and this presumption exists at every stage of the litigation.” *Sanofi-Synthelabo v. Apotex, Inc.*, 470 F.3d 1368, 1375 (Fed. Cir. 2006) (internal quotation omitted). A defendant bears the burden of establishing patent invalidity by clear and convincing evidence. *See* 35 U.S.C. § 282(a); *Amgen Inc. v. F. Hoffman-La Roche Ltd.*, 580 F.3d 1340, 1362 (Fed. Cir. 2009). For a patent to be valid, it must be novel and nonobvious. 35 U.S.C. §§ 102, 103. This requires consideration of whether the claimed invention was previously patented and whether “the differences between the claimed invention and the prior art are such that the claimed invention as a

whole would have been obvious before the effective filing date” to “a person having ordinary skill in the art.” 35 U.S.C. § 103.

Regents’ Motion and Defendants’ response raise two distinct issues. First, is Ming PCT cognizable as prior art under the provisions governing international patents? Second, if not, may Dr. Wicker substitute the Ming US patent for the Ming PCT application to support his prior art opinions? No, and yes.

1. Ming PCT

The parties agree that pre-America Invents Act (“pre-AIA”) 35 U.S.C. § 102(e) determines whether Ming PCT is prior art to the ’230 and ’768 patents. Pre-AIA §102(e) provides two avenues for a patent application to serve as prior art. The second is at issue here: “an international application filed under the [Patent Cooperation Treaty] shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application **designated the United States** and was published under Article 21(2) of such treaty in the English language.” 35 U.S.C. § 102(e)(2) (emphasis added). This dispute turns on whether Ming PCT “designated the United States” for purposes of section 102(e).

For Regents, the answer is clear. The cover of the PCT application has a section for “Designated States.” The Ming PCT application designates a number of countries, but none are the United States. (See Gosen Ming Decl., Ex. 2 at 2.) It therefore does not satisfy section 102(e)(2).

Defendants point to the priority data section of the application, which indicates that the application seeks priority to the Ming US application. (*See id.*) Even though the United States is not included in the “Designated States” section, Defendants contend that the statutory definition of “designated” in section 102(e) is more capacious. For purposes of Chapter 35, “[t]he term ‘international application designating the United States’ means an international application specifying the United States as a country in which a patent is sought.” 35 U.S.C. § 351(e). Per Defendants, marking a United States patent as the application from which priority is sought necessarily implies that a patent is sought in the United States. After all, how could an international application seek priority to a United States patent unless “a patent is sought” in the United States?

Though not completely unfounded, the Court will not adopt Defendants’ view. To begin, Defendants bear the burden of proving invalidity. 35 U.S.C. § 282(a). A PCT application is relatively weak evidence of designation when the actual designation section of the application excludes the United States. Accepting the Defendants’ arguments would also undermine the notice function of designation. A prospective United States patent applicant would naturally check the “Designated States” section of a PCT application and feel relatively secure under § 102(e)(2) if the United States was not included in the list. It is also not overly burdensome to require an applicant to check the appropriate boxes for designated states even if the same country is already listed in the priority section.

The Manual of Patent Examining Procedure (“MPEP”) confirms this reading. It clarifies that “[t]he international application for which the priority of one or more earlier applications filed in or for a Contracting State is claimed **may** contain the designation of that State.” (Gosen Ming Reply Decl. ¶ 2, Ex. A at 6 (reproducing Appendix T of the 2001 MPEP).) If claimed priority was coterminous with designation, the application would—not may—designate the contracting state.

Ultimately, because the Ming PCT application did not “designate” the United States for purposes of pre-AIA § 102(e)(2), the Court will grant Regents’ Motion for Summary Judgment and not allow Defendants to argue invalidity based on the Ming PCT application.

2. Ming US

Defendants argue in the alternative that Dr. Wicker should be allowed to substitute the Ming US application for the Ming PCT application to make his prior art arguments. Even though Dr. Wicker primarily opined on Ming PCT as prior art, Defendants assert—and Regents do not contest—that the two applications are identical in their relevant disclosures. The Court will allow Dr. Wicker to base his opinions on the Ming US application.

Regents ask the Court to slice the bologna awfully thin. They claim Dr. Wicker did not base any invalidity arguments on the Ming US patent. That may be technically true, but Dr. Wicker, when first describing the Ming PCT application, noted that it “substantively includes identical disclosure as the Ming [US application].” (Wicker Rpt.

¶ 249). While it may formally be too late for the Defendants to rely on a new ground for invalidity, Regents can hardly claim to be caught off guard by the Ming US application.

* * *

In sum, Ming PCT may not serve as prior art to invalidate the '230 and '768 patents, but Defendants may substitute Ming US to make the same arguments.

III. '230 PATENT AND ORIGINAL PATENT RULE

The Court will grant Regents' Motion for Summary Judgment that the '230 patent is not invalid under the original patent rule and deny Defendants' inverse motion to the same effect. Although the original patent rule applies to narrowing reissues, the '230 patent satisfies that rule.

A. Background

The '230 patent is a reissue of the '647 patent, granted pursuant to 35 U.S.C. § 251. (Wicker Rpt. ¶ 1034.) The '647 patent incorporated five provisional patent applications by reference. (Decl. of Alexander Chern Supp. Defs.' Mot. Summ. J. ("Chern Decl.") ¶ 3, Ex. 2 at 14, June 1, 2023, Docket No. 549.)

The '230 reissue includes some fairly significant alterations from the claims in the '647 patent. For example, both parties point to the following additions and changes to claim 1 of the patent:

'647	'230
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<p>A wireless communication device comprising:</p> <p>an encoder that applies a linear transformation to a stream of information bearing symbols selected from a constellation having a finite alphabet to produce a stream of precoded symbols that are complex numbers and are not restricted by the constellation of the information bearing symbols; and</p> <p>a modulator to produce an output waveform in accordance with the stream of precoded symbols for transmission through a wireless channel.</p>	<p>A wireless communication device comprising:</p> <p><i>a first encoder that encodes a data stream based on an error-control code to produce encoded symbols;</i></p> <p><i>an interleaver that interleaves the encoded symbols to produce interleaved symbols;</i></p> <p><i>a constellation mapper that maps the interleaved symbols to produce a stream of information bearing symbols selected from a constellation having a finite alphabet;</i></p> <p><i>[an]</i> <i>a second</i> encoder that applies a linear transformation to <i>[a]</i> <i>the</i> stream of information bearing symbols selected from <i>[a]</i> <i>the</i> constellation having <i>[a]</i> <i>the</i> finite alphabet to produce a stream of precoded symbols <i>that</i> are complex numbers and that are not restricted by the constellation of the information bearing symbols; and</p> <p>a modulator to produce an output waveform in accordance with the stream of precoded symbols for transmission through a wireless channel.</p>
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(Gosen Ming Decl. ¶¶ 4–5, Ex. 3 at 28, Ex. 4 at 23.)

The reissue made similar changes to claim 16 of the '230 patent and added a new 49th claim. (Defs.' Mem. Supp. Mot. Summ. J. at 8–9, June 1, 2023, Docket No. 555.))

Regents claim that all additions to the '647 patent in the '230 reissue stem from the five provisional applications incorporated by reference into the '647 patent.

B. Analysis

When a patent is defective, the patentee may apply for a reissued patent that cures the error. *See* 35 U.S.C. § 251. The so-called “original patent rule” applies to such reissues. Stemming from judicial doctrine, Congress only allows reissue “for the invention disclosed in the original patent.” 25 U.S.C. § 251(a); *Antares Pharma, Inc. v. Medac Pharma Inc.*, 771 F.3d 1354, 1358–62 (Fed. Cir. 2014) (cataloging the precedential and statutory history of the original patent rule). The original specification “must clearly and unequivocally disclose the newly claimed invention” in the reissue. *Antares*, 771 F.3d at 1362. That is, the original specification “must do more than merely suggest or indicate the invention recited in reissue claims.” *Forum US, Inc. v. Flow Valve LLC*, 926 F.3d 1346, 1351 (Fed. Cir. 2019); *see also U.S. Indus. Chems., Inc. v. Carbide & Carbon Chems. Corp.*, 315 U.S. 668, 676 (1942).

Compliance with the original patent rule is generally a matter of law, appropriate for summary adjudication. *See Forum US*, 926 F.3d at 1350–51. The inquiry may still present underlying questions of fact as to what a specification says on its face, and the Court may consult expert evidence to construe the meaning of terms of art. *See id.* The inquiry focuses on the original specification rather than original claims; indeed, the very point of a reissue is often to alter the original claims. *Antares*, 771 F.3d at 1362. The question, then, “is whether one skilled in the art, reading the specification, would identify the subject matter of the new claims as invented and disclosed” in the original

specification. *Forum US*, 926 F.3d at 1353 (quoting *In re Amos*, 953 F.2d 613, 618 (Fed. Cir. 1991)).

1. Scope of the Original Patent Rule

The Court must first decide if the original patent rule even applies to the '230 reissue. Regents claim the original patent rule only applies to broadening reissues—those that “enlarg[e] the scope of the claims of the original patent.” 35 U.S.C. § 251(d). While Regents are correct that broadening reissues are significantly more likely to run afoul of the original patent rule, it would be a bridge too far to hold that the original patent rule **never** applies to narrowing reissues.

Regents primarily make their case by pointing to over a century’s worth of decisions applying the rule to broadening reissues. Many of those cases contain some language tying the original patent rule to broadening reissues. *See, e.g., Corbin Cabinet Lock Co. v. Eagle Lock Co.*, 150 U.S. 38, 42–43 (1893) (“It is settled by the authorities that, to warrant new and **broad**er claims in a reissue . . . it must further appear from the **original patent** that they constitute parts or portions of the invention, which were intended or sought to be covered or secured by such original patent.” (emphasis added)).

The original patent rule undoubtedly presents a heightened challenge for broadening reissues. But even though many cases say the original patent rule applies to broadening reissues, none say the rule applies **only** to broadening reissues and there are several reasons for the Court to not so hold.

First, the statutory structure. 35 U.S.C. § 251(a) establishes the rules for reissue patents “in general,” while section 251(d) covers broadening reissues only. If Congress wanted the original patent rule to apply only to broadening reissues, it could have put the rule in section 251(d). Instead, it inserted the language in section 251(a), mandating application to all reissues.

Second, it would be a historic anomaly to apply the rule only to broadening reissues. After all, the original patent rule first appeared nearly thirty years before the Supreme Court even approved broadening reissues. *Compare Battin v. Taggert*, 58 U.S. (17 How.) 74, 84–85 (1854) (original patent rule), with *Miller v. Bridgeport Brass Co.*, 104 U.S. 350, 351, 354–55 (1881) (broadening reissues); accord *Antares*, 771 F.3d at 1359 (“The requirement became even more important when the Supreme Court first held that broadening reissue applications were permissible.”). It would make little sense to constrain the rule to a context that did not even exist at the time the rule developed.

Finally, and perhaps most importantly, the Federal Circuit is skeptical of a broadening only limitation. In *Cioffi v. Google, LLC*, a Federal Circuit panel invalidated reissue claims under the original patent rule. No. 18-1049, 2023 WL 2981491, at * 6 (Fed. Cir. Apr. 18, 2023). The full court later issued an order denying Cioffi’s petition for rehearing en banc. No. 18-1049 (Fed. Cir. July 17, 2023) (per curiam). In that order, the Federal Circuit rejected the petitioners’ theory that the original patent rule does not apply to narrowing reissues.

To be sure, the Federal Circuit’s statements in the order denying rehearing are not controlling; they are dicta within dicta. Though the petitioners argued that the original patent rule does not apply to narrowing reissues, the Federal Circuit concluded it “d[id] not need to decide that issue” because (1) petitioners had waived that argument, and (2) the claims at issue were broadening reissues. *Id.* at 2–3. Nonetheless, the order still serves as persuasive authority. The Federal Circuit concluded that neither its precedent nor the text of section 251 support limiting the original patent rule to broadening reissues. *Id.* The Court will hold the same.

Although there is no firm precedential command against applying the original patent rule to narrowing reissues, such reissues may more easily pass muster. Even if narrowing reissues are more likely to satisfy the original patent rule, though, the Court will not hold that they are automatically valid without examining the specific reissues in this case.

2. Application of the Original Patent Rule

Defendants do not allege the claims in the ’230 reissue were pulled out of thin air. (*Cf.* Decl. of Conrad A. Gosen Supp. Pl.’s Opp’n to Defs.’ Mot. Summ. J. ¶ 2, Ex. 1 at 12–128,, July 13, 2023, Docket No. 660) (tracing each ’230 claim to the ’647 specification or material incorporated therein).) The dispute instead is whether the original ’647 specification disclosed the ’230 claims in a clear enough fashion to satisfy the original patent rule. And specifically, whether incorporation by reference is clear enough.

The law is surprisingly thin on whether material incorporated by reference satisfies the original patent requirement. Neither party cites any case that specifically addresses that question. But Defendants bear the burden of proof as the moving party, not to mention the presumption of validity of the reissued patent absent clear and convincing evidence to the contrary. *See Sanofi-Synthelabo*, 470 F.3d at 1375; 35 U.S.C. § 282(a).

Absent specific caselaw on the matter, Defendants rely on the general rule that the original specification must “clearly and unequivocally” “expressly disclose[]” the “exact embodiment claimed on reissue.” *Cioffi*, 2023 WL 2981491, at *4 (quoting *Antares*, 771 F.3d at 1362–63). Incorporation by reference, they claim, is not clear or unequivocal enough to satisfy that standard. But the Court sees no reason why a proper citation on the face of the reissue application is not clear enough to satisfy the original patent rule when the only real difference would be whether the applicant wrote a proper citation to the source material instead of copying and pasting that content into the specification.

One non-controlling opinion, *Dart Indus., Inc. v. Banner*, 636 F.2d 684 (D.C. Cir. 1980), suggests incorporation by reference does not suffice. The reference there read “this application is a continuation-in-part of my copending application.” *Id.* at 686. The court denied the reissue, claiming incorporation of the “copending application” claims would add new matter in violation of section 251. *Id.* at 687–88.

Nonetheless, the incorporation statement in *Dart Industries* was far less explicit than the incorporation statement in the ’647 application. Marking an application as a

“continuation-in-part” is not nearly as clear an indication of desire to incorporate as recitation of the provisional applications, “the entire contents of which are incorporated herein by reference.” *Compare id.* at 686, with (Chern Decl. ¶ 3, Ex. 2 at 14.) In fact, the court in *Dart Industries* contrasted the continuation-in-part language with an “incorporation by reference in an application of matter elsewhere written down (not necessarily in a patent application), for economy, amplification, or clarity of exposition, by means of an incorporating statement clearly identifying the subject matter which is incorporated and where it is to be found.” *Id.* at 686 (quotation omitted). The incorporation in the ’647 specification meets that description, unambiguously incorporating identified matter for brevity’s sake.³

Defendants not only take issue that material was incorporated by reference, but also that the original application incorporated too many disparate sources. Again, though, they provide little support for their “too much material” argument beyond the general “clear and unequivocal” standard of the original patent rule. So long as the underlying claims are in fact reflected in those sources, the Court finds the disclosure no less explicit than a monstrous application that copies and pastes the claims instead.

³ Defendants also point to the specification requirements of 35 U.S.C. § 112, which forbids parties from incorporating “essential material” by reference. *See* 37 C.F.R. § 157(d). To the extent a regulation governing section 112 even applies to section 251, though, it would not apply to the ’647 application because the application was filed before the regulation was enacted. *Compare* 69 Fed. Reg. 56482, 56539 (Sept. 21, 2004), with (Chern Decl., Ex. 2 at 2 (showing the application was filed in 2003).).

In sum, because reissues are presumed valid and the Court finds incorporation by reference sufficient to satisfy the original patent rule, the Court will grant Regents' motion for summary judgment that the '230 patent is not invalid and deny Defendants' converse motion.

IV. NON-INFRINGEMENT

In patent cases, "summary judgment of noninfringement is proper when no reasonable factfinder could find that the accused product contains every claim limitation or its equivalent." *Medgraph, Inc. v. Medtronic, Inc.*, 843 F.3d 942, 949 (Fed. Cir. 2016). Defendants claim five separate infringement issues are ripe for summary judgment. But because genuine disputes of material fact remain, the Court will deny Defendants' Motion in full.

A. Issue 1: Mapping Interleaver Output

Defendants' move for non-infringement of '768 claims 1, 13, 18, and 21, and '230 claims 1, 2, 3, 16, 17, 42, 46, and 49 (collectively, the "LP Patents"). Because the Court will allow Regents to introduce a doctrine of equivalents theory of infringement, the Court will deny Defendants' motion as to the first issue.

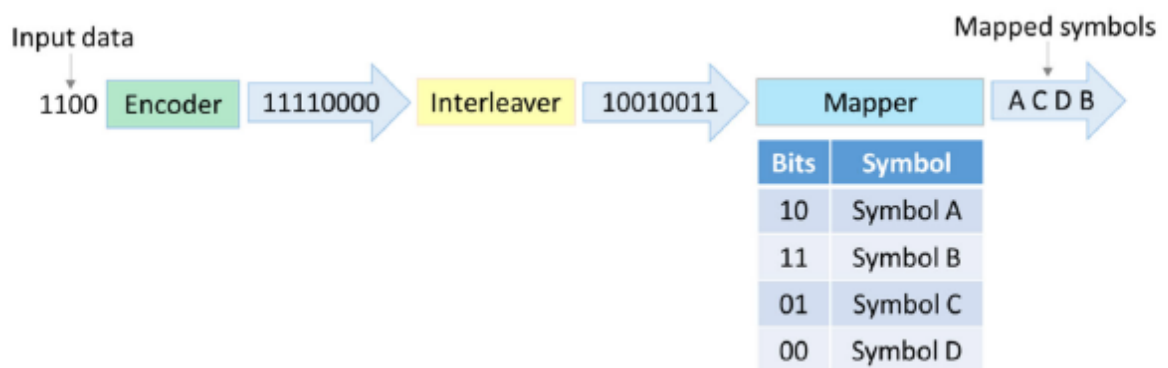
1. Background

The LP Patents all (1) encode, (2), interleave, and (3) map data. The accused products add a step 2.5 in between interleaving and mapping: scrambling. (Sealed Exs. Decl. Conrad A. Gosen Supp. Pl.'s Opp. Defs.' Mot. Summ. J. Non-Infringement ("Sealed Gosen Non-Infringement Decl."), Ex. A ¶ 250, July 14, 2023, Docket No. 664.) Encoding

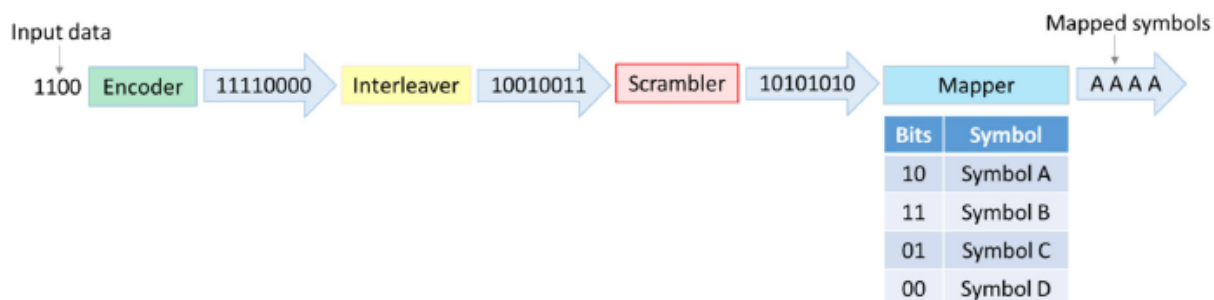
adds redundancy to information streams to allow identification and correction of errors. (Sealed Exs. Supp. Decl. Marc L. Kaplan Supp. Defs.’ Mot. Summ. J. Non-Infringement (“Sealed Kaplan Exs.”), Ex. 2 ¶ 59, June 2, 2023, Docket No. 617.) Interleaving reorders the encoded bits. (*Id.* ¶ 192.) Scrambling then modifies the representation of an interleaved bit sequence so there are roughly equal numbers of ones and zeroes and ensures there are no long sequences of ones or zeroes. (*Id.*, Ex. 11 ¶ 229.) Finally, mapping, as relevant here, converts groups of ones and zeroes to predetermined symbols that represent those bits. (*Id.*, Ex. 2 ¶ 72.) Of primary importance to this dispute is everything that happens after interleaving. That is, scrambling (where applicable) and mapping.

Defendants provide a helpful overview illustration of these steps, undisputed by Regents, with example input data of 1100:

LP Patents:



Accused Technology:



(Defs.’ Mem. Supp. Summ J. Non-Infringement (“Defs.’ Non-Infringement MSJ”) at 9–10, June 1, 2023, Docket No. 581.)

The LP Patent claims all specify that “the interleaved” data is mapped. (*See, e.g.* Decl. Marc L. Kaplan Supp. Defs.’ Mot. Summ. J. Non-Infringement (“Unsealed Kaplan Exs.”), Ex. 1 at 28, June 1, 2023, Docket No. 583.) Following fact discovery, Regents moved to add a doctrine of equivalents theory to its infringement claims. (Decl. Conrad A. Gosen Supp. Pl.’s Mot. Leave Amend, Ex. A at 9–10, Dec. 16, 2022, Docket Nos. 395, 396.) They alleged that there is no “substantial difference” between the interleaved and scrambled data streams for purposes of mapping because the scrambled data represents the same underlying interleaved data. (*Id.*) Magistrate Judge Tony N. Leung denied Regents’ motion to add a doctrine of equivalents theory, ruling that Regents were not diligent in timely adding the theory. (Tr. Hearing Mot. Leave to Amend at 41–44, Jan. 27, 2023, Docket No. 444.)

2. Analysis

As Defendants note, the Magistrate Judge’s order denying Regents’ motion to add a doctrine of equivalents theory would be all but fatal to Regents’ theory of infringement.

Failure to allow a doctrine of equivalents theory would leave Regents with only a literal infringement claim, where Regents would have to establish that “every limitation set forth in a claim must be found in an accused product, exactly.” *Advanced Steel Recovery, LLC v. X-Body Equip., Inc.*, 808 F.3d 1313, 1319 (Fed. Cir. 2015) (quotation omitted).

Because each claim with a mapping step requires mapping “**the** interleaved” data stream, technology that only maps scrambled outputs does not literally infringe the patent.⁴ It maps a slightly different configuration of data than the data from the interleaved stream. Regents claim there is a battle of the experts as to whether the scrambled data is effectively the same as the interleaved data. (*Compare* Sealed Kaplan Exs., Ex. 11 ¶¶ 232–36, *with* Sealed Gosen Exs., Ex. D ¶ 34.) This is precisely the argument the doctrine of equivalents is meant to capture, though. *See Warner-Jenkinson Co., Inc. v. Hilton Davis Chem. Co.*, 520 U.S. 17, 21 (1997) (“[A] product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is ‘equivalence’ between the elements of the accused product or process and the claimed elements of the patented invention.”). But even if scrambling only changes the representation of the underlying data, Defendants’ products do not literally map “the interleaved data stream.” They map its equivalent: the scrambled data.

⁴ Claims 13 and 21 of the ’768 patent discuss mapping “the encoded data stream” rather than “the interleaved” data stream. The forthcoming analysis applies equally to that language: no more is the unit mapping “the encoded” data than it is mapping “the interleaved” data.

At times, Regents suggest that the scrambled data is the interleaved data, so there is literal infringement. Even under a summary judgment standard, though, the Court finds that no reasonable jury could accept that assertion. Briefly consider the example chart, above. The interleaved data stream is 10010011. The scrambled data stream is 10101010. By the time that scrambled data stream is mapped, it is not identical to the interleaved data stream, even if the underlying message it carries is the same. Regents contend that the scrambled data is the same as the interleaved data because the underlying data is preserved, and upon unscrambling the interleaved data again appears. But that is the whole point of this technology: to change the representation of data while maintaining the underlying information. If a user inputs 1100 and all technology works according to plan, the receiver will ultimately output 1100 even though the underlying data has undergone changes of representation in the meantime.

Notwithstanding the above analysis, the Court will deny summary judgment because it will allow Regents leave to introduce a doctrine of equivalents theory of infringement. From a case management perspective, the Magistrate Judge was correct to deny Regents' motion to amend. But in a case that is nearly ten years old, the Court is willing to allow minor flexibility on issues of timing to ensure full resolution of significant issues. Just as the Court will allow Defendants' to rely on the Ming US application for their invalidity arguments, the Court will allow Regents to rely on the doctrine of equivalents for their interleaver infringement claims. To the extent a brief reopening of discovery is

necessary to allow development of those two issues, the parties may file appropriate motions with the Magistrate Judge.

B. Issue 2: Restricted to the Mapper

The Court will deny summary judgment as to Issue 2 because Defendants did not advance the theory of non-infringement as to '768 patent claims 13 and 18 that they now expect Regents' expert to rebut.⁵

1. Background

The '768 patent has several claim limitations comparing characteristics of the "alphabet" for a precoder with the "alphabet" for a related mapper. Signal-processing alphabets have some number of distinct symbols. For example, the mapper in the illustration provided for Issue 1, above, had four symbols in its alphabet: A, B, C, and D.

Claim 13, on which claim 18 is dependent, specifies a limitation for a transmitter that includes "a precoder that linearly precodes the constellation symbols over a complex field without restriction to an alphabet size of the constellation to produce a joint coded-precoded data stream." (Unsealed Kaplan Exs., Ex. 12 at 19.) The parties have jointly stipulated that "over a complex field without restriction to an alphabet size" means "that

⁵ Defendants admit that their non-infringement theories for claims 1 and 21 were contingent on the Magistrate Judge granting their motion to strike. (Defs.' Non-Infringement MSJ at 24.) Because the Magistrate Judge denied Defendants' motion to strike and the Court has affirmed that order, the Court will deny Defendants' motion for summary judgment of non-infringement of claims 1 and 21. (See Sealed Order at 10, Nov. 17, 2023, Docket No. 719; Mem. Op. & Order Den. Defs.' Appeal at 8, Feb. 22, 2024, Docket No. 738.)

can produce a number of different complex values that are not limited to the number of constellation symbols that can be produced by the mapping unit.” (Joint Claim Construction Statement (“JCC”) at 4, Oct. 20, 2021, Docket No. 298.) For claims 13 and 18, it is the size of the alphabet that matters. Any alphabet size that differs would satisfy the limitation.

2. Analysis

Defendants argue there is no dispute of material fact as to whether the accused precoders “can produce a number of different complex values that are not limited to the number of constellation symbols that can be produced by the mapping unit,” as required by the claim construction. (Defs.’ Non-Infringement MSJ at 21.) Defendants’ expert found that the accused mapper and accused precoder each produce four symbols, so the alphabet size does not change, and thus the limitation is not met. (Sealed Kaplan Exs., Ex. 11 ¶¶ 251–56.) Defendants’ argument hinges primarily on the fact that Regents’ expert does not address whether the size of the alphabet changes.

Regents’ expert did not address the size of the alphabet because Defendants’ non-infringement contentions did not dispute that their products infringe on the alphabet size limitation. (*See id.*, Ex. 16 at 6–8.) Their non-infringement contention for claim 13 simply incorporated their contentions for claim 1 by reference. (*See id.* at 3, 7.) But alphabet size does not matter for claim 1; indeed, the very motion before the Court now admits that claim 1 presents a different alphabet issue from claim 13. (*See id.*) Because the alphabet size was not disputed, there was nothing for Regents’ expert to respond to.

Defendants claim that Regents never alleged infringement of the alphabet size limitation, so Defendants were the ones that did not need to respond. Nonetheless, in Regents' infringement claim chart for the '768 patent, they claim "Defendant's LTE network has included and continues to include systems that also have a precoder that linearly precodes the constellation symbols over a complex field **without restriction to an alphabet size of the constellation** to produce a joint coded-precoded data stream." (Sealed Exs. Supp. Decl. Marc L. Kaplan Supp. Defs.' Reply Mem. Summ. J. Non-Infringement ("Sealed Kaplan Reply Exs."), Ex. A at 18, Aug. 10, 2023, Docket No. 674 (emphasis added).) This infringement allegation references infringement of the alphabet size limitation. Accordingly, the Court will deny the Motion for Summary Judgment of non-infringement of claims 13 and 18 of the '768 patent.

C. Issue 3: Symbol Interleaver

Defendants move for summary judgment of non-infringement of all '768 claims. There is a genuine dispute of material fact between the parties' experts, so the Court will deny Defendants' motion.

1. Background

Each independent claim of the '768 patent (Nos. 1, 13, 21) requires an interleaver process. (Unsealed Kaplan Exs., Ex. 12 at 18–19.) In its claim construction order, the Court constructed all interleaver terms, including those in the '768 patent, identically. (Claim Construction at 24.) The Court resolved two primary disputes in the order. (*Id.*) Importantly, it rejected Regents' assertion that "interleave" should be construed to

include interleaving groups of symbols, rather than solely interleaving individual symbols. (*Id.* at 26.) The Court held that “[t]he term ‘interleave’ on its face, does not include the interleaving of groups of symbols,” and the patents make clear the subject is individual symbols/bits. (*Id.* at 26–27.)

Shortly thereafter, Regents moved for reconsideration of the Court’s construction of interleaver terms. (Pl.’s Mot. Reconsider Construction of Claim Terms, Aug. 25, 2022, Docket No. 349.) Nowhere in the motion did Regents object to the Court’s ruling on symbol groups. (*See id.* at 4–5.) Rather, it worried that the Court’s order did not give separate definitions to interleaver in the various places it appeared throughout the ’230 and ’768 patents. (*Id.*) The parties stipulated to a construction providing various definitions of the term as it appeared in different locations, which the Court approved. (Order Am. Construction of Claim Terms, Dec. 9, 2022, Docket No. 385.) As relevant here, it provided the following two constructions:

Claim Term	The Court’s Construction
“interleaved data stream” (768:1, 13, 21)	bits of the encoded data stream that have been reordered
“processing the [sic: precoded] symbols to produce permuted blocks of [sic: precoded] symbols” (768:21)	taking the precoded symbols and reordering them

(*Id.* at 3.)

The accused product here interleaves quadruplets of symbols. (*See Unsealed Kaplan Ex., Ex. 8 at 9.*) Regents do not dispute that these quadruplets are “groups” of symbols.

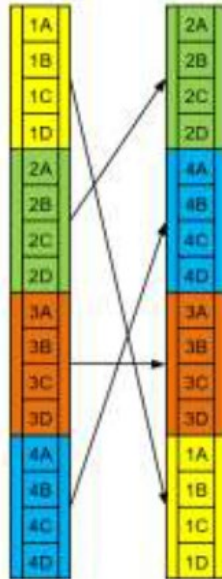
2. Analysis

Regents raise both a procedural and a substantive argument as to why the accused product does not fit into the carveout for group interleaving that the Court has already addressed. Only the substantive argument is meritorious.

First, Regents argue that the Court's construction order that addressed group interleaving does not govern; it was superseded by the stipulated amendments. Not so. To begin, the group analysis played no role in the amendment. Regents' motion was completely unrelated, challenging instead whether "interleaver" could be defined universally. Then, in reaching a stipulated compromise, Defendants clarified with Regents that the amendments incorporated the portion of the Court's ruling excluding interleaved groups. (Decl. Marc L. Kaplan Supp. Defs.' Reply Mem. Supp. Mot. Summ. J. Non-Infringement, Ex. 24 at 4, Aug. 10, 2023, Docket No. 673.)

Even if the Court's ruling on interleaving groups of symbols somehow evaporated (it did not), Regents provide no reason why the Court's logic during claim construction should not apply equally now.

Regents next argue that, even if the construction order governs, it does not defeat the infringement claim. Under the Court's construction, interleaving involves "reordering" symbols. When groups of symbols are reordered, some symbols are also reordered relative to one another. This theory is best illustrated by Regents' example, below:



(Pl.'s Opp. Defs.' Mot. Summ J. Non-Infringement at 35, July 13, 2023, Docket No. 661.)

When groups are interleaved, individual symbols in one group will be reordered relative to individual symbols in another. For example, orange 3A no longer sits in the same position relative to green 2A. Thus, even though groups are interleaved, so too are individual symbols. The Court's prior orders never said groups may not be interleaved, only that group interleaving is not independently sufficient.

As Defendants observe, it is difficult to imagine a situation in which groups will be interleaved while individual symbols are not. Though Regents' theory pushes the bounds of the Court's claim construction order, it is sufficient to go to trial when the Court can further assess the theory after testimony. As Regents' expert notes, the interleaver here "take[s] the precoded symbols and reorder[s] them," which is what the construction order requires. (Order Am. Construction of Claim Terms at 3.)

D. Issue 4: Null Subcarrier

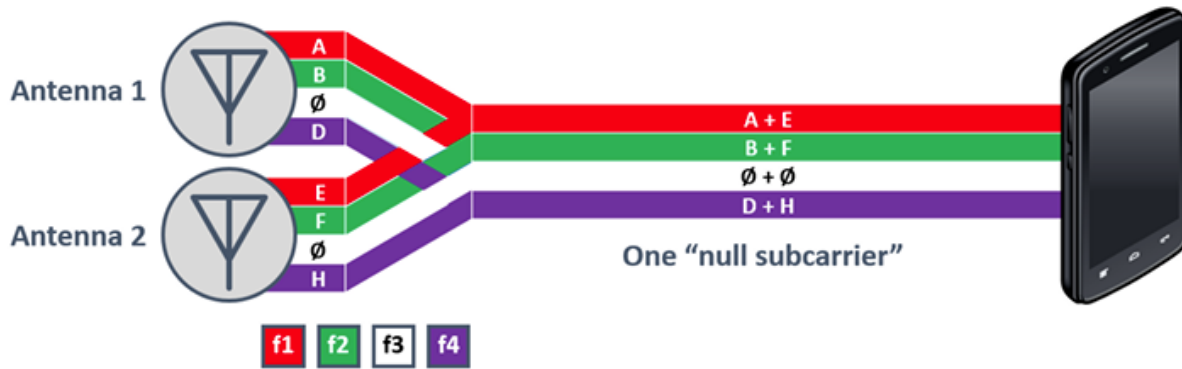
Issue Four essentially boils down to one question: What does it mean for a null subcarrier to appear in a Multiple Input, Multiple Output (“MIMO”) Multi-Carrier Waveform? Because the parties’ experts establish a genuine dispute of material fact on the matter, the Court will deny summary judgment as to Issue Four.

1. Background

All independent claims in the ’317 patent family⁶ require a “null subcarrier.” (*See, e.g.,* Decl. Conrad A. Gosen Supp. Pl.’s Opp. to Defs.’ Mot. Summ. J. Non-Infringement (“Unsealed Gosen Non-Infringement Exs.”), Ex. N at 20, 26, 28–29, July 13, 2023, Docket No. 663.) For purposes of the ’317 patent family, the Court construed “subcarrier” as follows: “In a MIMO multi-carrier waveform, one of a number of carrier frequencies within a larger frequency band.” (Claim Construction at 37.) The Court limited subcarriers in the ’317 family to MIMO systems because every patent in the family “clearly use[s] MIMO systems.” (*Id.* at 38.) As to what a MIMO system is, the Court provided a fairly barebones statement that “in a MIMO transmission system, the transmitter uses multiple antennas to transmit data to a receiver.” (*Id.* at 37.) The Court also constructed “null subcarrier” as “[a] subcarrier on which no value is intended to be transmitted during a specific time period.” (*Id.* at 39.)

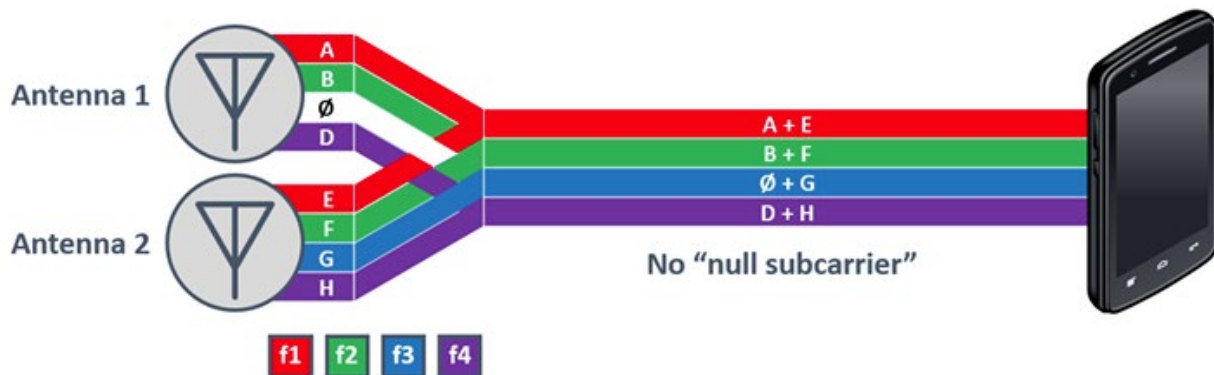
⁶ ’317 claim 1, ’185 claim 9, ’309 claims 13, 16, 19, 23, and 24.

In a MIMO system, the receive antennas detect a combined signal from all of the transmit antennas. (Sealed Gosen Non-Infringement Decl., Ex. A ¶ 94.) Defendants provide a simplified illustration of the process as follows:



(Defcs.' Non-Infringement MSJ at 32 ¶ 7 (annotations omitted).)

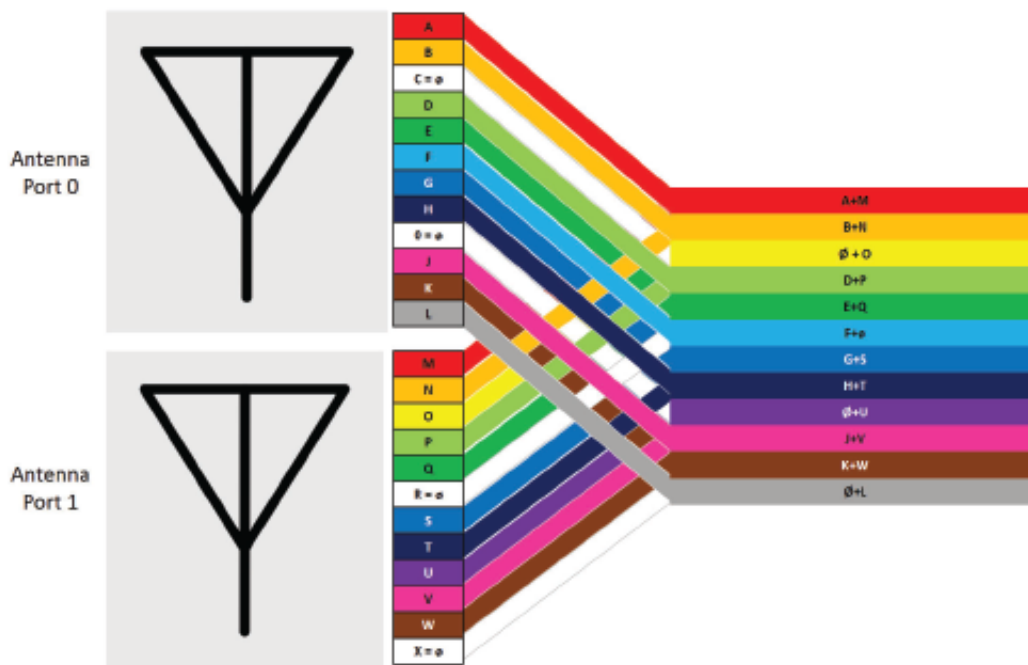
Essentially, the transmissions from separate antennas are "added" together. (*Id.*) When both antennas transmit a null subcarrier (\emptyset) on the same frequency (here, f3), their addition still results in continued propagation of a null subcarrier. On the contrary, when one transmission source transmits a null subcarrier on a frequency while the other transmitter transmits a non-zero waveform on the same frequency, the combined waveform is no longer zero:



(*Id.* at 32 ¶ 8 (annotations omitted).)

Thus, though antenna 1 transmits a null subcarrier on f_3 , antenna 2's simultaneous transmission of value G on f_3 results in a combined waveform with value G . There is no longer a null subcarrier once they are combined.

In the accused technology, the frequency addition happens by virtue of the transmission frequencies being OFDM⁷ modulated, simultaneously transmitted, and then superimposed in the propagation environment. (Sealed Kaplan Exs., Ex. 18 ¶ 148.) Defendants' expert illustrates the MIMO transmission process in the accused technology as follows:



(*Id.*)

⁷ Orthogonal frequency division multiplexing.

This illustration maps on to the second of the simplified illustrations, above. Although each antenna transmits multiple null subcarriers, they do not transmit a null subcarrier on any of the same frequencies. Thus, none of the subcarriers that reach the receiver after superimposition are null subcarriers. Defendants' expert claims the superimposition process results in a MIMO waveform. (*Id.*) So in the above illustration, the combined stream would be the MIMO waveform, while the individual pre-addition transmissions are non-MIMO waveforms. Regents' expert contends the accused technology still transmits null subcarriers within the MIMO system. (*See, e.g.,* Sealed Gosen Non-Infringement Decl., Ex. P ¶¶ 37–39.) It is undisputed that the system as a whole is a MIMO system.

2. Analysis

The question remaining is whether, for purposes of the '317 family, it is enough for a null subcarrier to appear anywhere in a MIMO system. The Court analyzed the "MIMO multi-carrier waveform" in its claim construction order but did not answer this question. The parties present conflicting expert opinions on the matter. Defendants claim that the null subcarrier must appear once the multiple transmissions are superimposed in the propagation environment—i.e., where the frequency streams meet in the images, above. That meeting, they contend, is what makes a "MIMO multi-carrier waveform." Regents counter that the initial transmission from the antennas (as illustrated, before the streams meet), are still MIMO multicarrier waveforms. So the accused technology includes null subcarriers in a MIMO multicarrier waveform. Defendants would like the Court to rule as

a matter of law, but it is for the jury to decide which expert is correct, and whether the null subcarrier in the accused technology is in a MIMO multicarrier waveform.

E. Issue 5: Receiver Limitations

Because there is a genuine dispute of material fact as to whether user equipment (“UE”) infringes the receiver limitation of ’309 patent claim 23 and ’768 patent claims 13 and 18 the Court will deny summary judgment for Issue 5.

1. Background

The disputed patent claims have limitations implemented at both the transmitter and at a receiver. For example, ’309 claim 23 adds to the patented system “a wireless communication device configured to receive the transmission signals as received signals, wherein the wireless communication device is configured to (i) estimate a carrier frequency offset based on the received signals and (ii) perform channel estimation of the MIMO channel based on the received signals.” (Unsealed Kaplan Exs., Ex. 20 at 29.) Claims 13 and 18 of ’768 likewise require “a receiver that receives the waveform from the transmitter via a wireless communication channel, and demodulates the waveform to produce estimated data.” (*Id.*, Ex. 12 at 19.)

Regents did not conduct any third party discovery from UE manufacturers (e.g. Apple or Samsung) to learn how the UE products operate as receivers. But Regents’ expert opined that, based on his knowledge and experience, essentially any UE receiving data from the Defendants’ transmitters would have to estimate carrier frequency offsets and perform channel estimation. (*See, e.g.*, Sealed Gosen Non-Infringement Decl., Ex. F

¶ 166 (“Receiving the waveform, demodulating the waveform, and producing estimated data are necessarily performed by all LTE-compliant UEs when they are connected to an LTE network because these steps are necessary for a UE to accurately receive LTE data transmissions from a base station.”).)

2. Analysis

Defendants present two related issues with the UE limitation: first, whether there is sufficient evidence to show that UEs on Defendants’ networks infringe the receiver limitation; second, whether Defendants “use” the UEs.

a. Sufficiency of the Evidence

Regents have presented enough evidence of receiver infringement to survive a motion for summary judgment. Defendants take issue with Regent’s expert not considering any particular UEs in forming his opinion. However, experts need not present the best possible evidence. Rather, they must present enough evidence to suggest infringement may be found. Because Regents’ expert opined that **any** UE would satisfy the limitation, a jury could find for Regents even absent presentation of any specific UEs. If Defendants believe that reasoning is faulty, they may expose its deficiencies through cross examination and presentation of contrary evidence.

Defendants also claim the expert testimony is lacking because Dr. Wells does not examine UE source code to determine **how** the UEs complete the required functions. But the patent limitations do not require the estimation be conducted in any particular manner, just that it happen at all.

If Defendants believe it was inappropriate for Dr. Wells to opine on the receiver claims without more underlying UE data, the appropriate recourse would have been a motion to strike under Fed. R. Evid. 702(b). But where Dr. Wells' opinion remains part of the record, Regents have established a genuine dispute of material fact.

b. Use and Benefit of UEs

Defendants also claim that, as network carriers, they do not use or benefit⁸ from the UEs that infringe on the receiver limitation. That is, they control the transmitters, but the receivers (e.g., an iPhone) are out of their hands. To be liable for direct infringement, a party must “use each and every element of a claimed system.” *Centillion Data Sys., LLC v. Qwest Commc’ns Int’l Inc.*, 631 F.3d 1279, 1284 (Fed. Cir. 2011). In *Centillion*, though, the Federal Circuit clarified that physical control over the infringing product was unnecessary. *Id.* For example, when transmitting a message, a party may “use” the patented technology by making the recipient technology “work for [its] patented purpose.” *Id.* That is the situation here. Even if the carriers do not control a given cell phone, they cause that receiver to be used for the patented purpose by transmitting the message. *See also Intellectual Ventures I LLC v. Motorola Mobility LLC*, 870 F.3d 1320, 1329 (Fed. Cir. 2017) (“[T]o use a system, a person must control **(even if indirectly)** and benefit from each claimed component.”) (emphasis added).

⁸ Defendants’ networks would have no use without UEs. There is no point in transmitting data without a receiver so Defendants’ argument on lack of benefit is without merit.

* * *

Because there is a genuine dispute of material fact as to all infringement issues, the Court will deny Defendants' motion in full.

V. INEQUITABLE CONDUCT

Defendants move for summary judgment of unenforceability of the '768 and '230 patents, as well as the '317 patent family, based on inequitable conduct. As to the first two, Defendants allege that Regents intentionally concealed prior art from the USPTO; as to the '317 family, Defendants allege Regents omitted inventors during examination. Because Regents' omissions do not rise to the high level of inequitable conduct necessary to establish unenforceability, the Court will deny Defendants' motion and dismiss any inequitable conduct defenses from this action.

A. Background

There are two distinct groups of patents at issue here, which the Court will address in turn.

1. '768 and '230 Patents

As previously discussed, the challenged '768 and '230 patents claim priority to several provisional applications, including Provisional Patent Nos. 60/374,886 ("886 provisional") and 60/374,935 ("935 provisional"). The '886 provisional incorporates an article the parties refer to as the "Fades Paper," and the '935 provisional includes the "ASILOMAR Paper." (See Decl. Brianne M. Straka Supp. Defs.' Mot. Summ. J. of

Unenforceability (“Straka Decl.”) ¶ 4, Ex. 3 at 4 (“’886 provisional”), June 1, 2023, Docket No. 588; Straka Decl. ¶ 9, Ex. 8 at 64 (“’935 provisional”).)

The Fades paper was first published in some capacity for a conference of the Institute of Electrical and Electronics Engineers (“IEEE”) in Taiwan between March 20–23, 2001. (Expert Report Sylvia D. Hall Ellis, Ph.D. ¶ 254, June 2, 2023, Docket No. 615.) Defendants allege the conference was open to persons of ordinary skill in the art and commonly distributed presented papers. (*E.g.* Dep. Sylvia Hall-Ellis, Ph.D. at 7, Aug. 10, 2023, Docket No. 678-1.) Regents allege that the paper was first available in a public library on June 20, 2001. (*See* Decl. Conrad Gosen Supp. Pl.’s Opp. Summ. J. Unenforceability (“Gosen Unenforceability Decl.”) ¶ 2, Ex. A. ¶ 289, July 13, 2023, Docket Nos. 656, 657.) The ’886 provisional was filed on April 22, 2002. (’886 provisional at 2.)

The version of the Fades Paper included in the ’886 provisional application removed the manuscript date and author names. (*See* Mem. Supp. Defs.’ Mot. Summ. J. of Unenforceability (“Unenforceability MSJ”) at 10, June 1, 2023, Docket No. 587.) The ASILOMAR paper was similarly altered in the ’935 provisional application to remove a 2000 publication date. (*Id.* at 12–13.)

Nearly two years after submitting the ’886 provisional application, Regents submitted an unaltered version of the Fades paper alongside 93 other references in an Information Disclosure Statement (“IDS”). (Straka Decl. ¶ 6, Ex. 5 at 11.) Regents referred

back to the Fades Paper at various points through their prosecution of the '768 patent. (*See, e.g., id.* at 26.)

2. '317 Patents

The '317 patent family claims priority to U.S. Provisional Application No. 60/472,297 ('297 provisional"). The '297 provisional draws on the "CFO article," and again omits author names. (Unenforceability MSJ at 14.) The '297 provisional lists Drs. Giannakis and Ma as the sole inventors, while Dr. Oh and Dr. Park were listed as additional authors on the CFO article. (*See* Straka Decl. ¶ 14, Ex. 13 at 2 ("'297 provisional").) Regents contend that Dr. Oh was a visiting researcher in Dr. Giannakis's lab and Dr. Park her mentor, but Dr. Oh's work on the '297 application was confined to writing computer programs modeling the inventions Drs. Ma and Giannakis had already established. (*See, e.g.,* Gosen Unenforceability Decl., Ex. I at 5–9.)

B. Analysis

1. Standard of Review

"Inequitable conduct is an equitable defense to patent infringement that, if proved, bars enforcement of a patent." *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1285 (Fed. Cir. 2011) (en banc). "Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the [PTO], which includes a duty to disclose to the [PTO] all information known to that individual to be material to patentability" 37 C.F.R. § 1.56(a). "A breach of this duty—including affirmative misrepresentations of material facts, failure to disclose material

information, or submission of false material information—coupled with an intent to deceive, constitutes inequitable conduct.” *Honeywell Int’l Inc. v. Universal Avionics Sys. Corp.*, 488 F.3d 982, 999 (Fed. Cir. 2007).

The party asserting inequitable conduct bears the burden of proving inequitable conduct. *Ulead Sys., Inc. v. Lex Computer & Mgmt. Corp.*, 351 F.3d 1139, 1146 (Fed. Cir. 2003). Inequitable conduct has two substantive elements. In order to succeed on their claim, Defendants must prove that in the prosecution of its patent, Regents “(1) made an affirmative misrepresentation of material fact, failed to disclose material information, or submitted false material information, and (2) intended to deceive the [PTO].” *Cargill, Inc. v. Canbra Foods, Ltd.*, 476 F.3d 1359, 1363 (Fed. Cir. 2007) (citation omitted). Courts disfavor inequitable conduct claims, whose remedy is the “atomic bomb of patent law,” and in recent years the Federal Circuit has opined that inequitable conduct claims have “become a common litigation tactic” that has come to “plague[] not only the courts but also the entire patent system.” *Therasense*, 649 F.3d at 1288–89.

Under the doctrine of infectious unenforceability, inequitable conduct as to an early application “may render unenforceable all claims which eventually issue from the same or a related application.” *Fox Indus., Inc. v. Structural Pres. Sys., Inc.*, 922 F.2d 801, 804 (Fed. Cir. 1990). Thus, if any of the challenged provisional applications are rendered unenforceable by inequitable conduct, so too may later patents tracing priority to them be disabled.

2. '768 and '230 Patents (Prior Art)

Defendants allege that the date omissions from the Fades paper in the '886 provisional and ASILOMAR paper in the '935 provisional render the resulting '768 and '230 patents unenforceable. Per Defendants, the dates would have revealed the papers were prior art, rendering the applications objectionable. The Court will deny Defendants' motion as to these two patents because the omission was neither material nor intentional.

a. Materiality

Defendants primarily contend the omission was material because the USPTO would have otherwise realized the papers were prior art under 35 U.S.C. § 102(b). Section 102(b) clarifies that where, as here, an inventor is the author of prior art, that art will not defeat the inventor's application if it was publicly disclosed less than one year before the application. Defendants argue that the omitted dates show that the papers were prior art published more than one year ahead of the application date, negating the statutory carve-out.⁹ The materiality test is generally one of but-for causation: absent the misrepresentation, would the patent have issued? *See Therasense*, 649 F.3d at 1296.

⁹ The parties debate when, for purposes of the prior art inquiry, the Fades paper was published. That question is not outcome-determinative. Either way, the '935 provisional included the ASILOMAR paper and was incorporated into both the '768 and '230 patents, so they may be held invalid on the ASILOMAR paper alone. Though the Court will not dwell on a non-dispositive matter, it will hold that the IEEE Fades paper manuscript satisfied 35 U.S.C. § 102(b)'s publication requirement. *Accord Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016); *GoPro Inc. v. Contour IP Holding LLC*, 908 F.3d 690, 694 (Fed. Cir. 2018).

Per Defendants, an examiner aware of the papers' publication dates would not have issued the patents.

The fact that the patents were issued after complete disclosure undermines the materiality allegations. The Fades paper, with date included, was provided to the USPTO in an IDS. The ASILOMAR paper, with date included, was disclosed in Regents' reissue application for the '230 patent. Because the applications were granted after disclosure of the papers with their dates, omission of their dates could not have been the but-for cause of issuance.

This finding is not without some doubt. In *Intellect Wireless, Inc. v. HTC Corp.*, the applicant submitted a false declaration to the USPTO to overcome a prior art reference. 732 F.3d 1339, 1342 (Fed. Cir. 2013). Though the applicant later submitted correct information, the Federal Circuit held the patent was still unenforceable because the applicant did not "expressly advise the PTO of [the misrepresentation's] existence, stating specifically wherein it resides." *Id.* at 1343 (citation omitted) (alteration in original). The applicant cannot fulfill their duty by "merely suppl[ying] the examiner with accurate facts without calling his attention to the untrue or misleading assertions sought to be overcome, leaving him to formulate his own conclusions." *Id.* Rather, the applicant must "take the necessary action . . . openly." *Id.* (omission in original). Defendants point to this duty to say the omission was material unless Regents explicitly and specifically pointed the USPTO to the paper dates while noting the prior omission, which they did not do.

Nonetheless, *Intellect Wireless* was about correcting an affirmative misstatement, while this issue is about backfilling an omission. With an omission, the examiner remains a blank slate. It would be one thing if the applicant said the papers were published in, say, March 2002. That may require Regents to direct the examiner to the actual, earlier, publication dates. But when the examiner does not necessarily have any date in mind and there is no misapprehension to correct, the duty to affirmatively point the examiner towards the correct date is less important. Accordingly, the Court will not extend the duty from *Intellect Wireless* to this case.

The Court will also not accept Defendants' invitation to forego the materiality requirement under the "exceptional circumstances" carveout. "When a patentee has engaged in affirmative acts of egregious misconduct," the party alleging inequitable conduct need not prove materiality. *Therasense*, 649 F.3d at 1292. "After all, a patentee is unlikely to go to great lengths to deceive the PTO with a falsehood unless it believes that the falsehood will affect issuance of the patent." *Id.* Examples of egregious misconduct include the filing of an unmistakably false affidavit, manufacturing false evidence, perjury, suppression of evidence, and bribery. *See id.* at 1293. Defendants do not bridge the gap, though, between those examples and the omissions at issue here. *Cf. id.* at 1292–93 ("Neither mere nondisclosure of prior art references to the PTO nor failure to mention prior art references in an affidavit constitutes affirmative egregious misconduct," so such claims still require proof of but-for materiality.")

b. Intent to Deceive

Specific intent to deceive must be “the single most reasonable inference able to be drawn from the evidence.” *Therasense*, 649 F.3d at 1290 (internal quotation omitted). “[W]hen there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found.” *Id.* Because intent to deceive is not the single most reasonable inference, the Court will deny Defendants’ motion on intent grounds as well.

First, though, it is worth a few words doing away with one unreasonable explanation Regents supply. They allege they did not operate with intent to deceive because the prosecuting attorney omitted author names and publication dates as his common practice. Common occurrence does not render an otherwise unlawful activity acceptable.

Setting aside common practice as an inherent justification, the prosecuting attorney alleged he left the dates off manuscripts because publication dates often changed. He may have incorrectly surmised in this case that the manuscript dates would differ from statutory publication dates and they were therefore irrelevant, but that does not establish intent to deceive. It establishes an incorrect judgment. Defendants contend that intent is satisfied when an applicant conceals material they “know[] or obviously should know would be material to the examiner.” *See, e.g., Cargill*, 476 F.3d at 1368. But those citations are to pre-*Therasense* cases. In *Therasense*, the Federal Circuit revisited inequitable conduct en banc because those claims were getting out of control. *Therasense*, 649 F.3d at 1285. As part of its efforts to hem in inequitable conduct claims,

the court expressly repudiated the “should have known” standard. *Id.* at 1290. Defendants have thus not put forth a plausible defense of inequitable conduct.

3. '317 Patents (Inventorship)

For many of the same reasons, the Court will deny Defendants’ motion with respect to the ’317 patent family.

a. Materiality

The Court’s above analysis of the ultimate issuance of the patents after disclosure applies equally here, counseling denial. But-for materiality has not been established. A few additional points unique to the ’317 patents are worth mentioning.

First, Defendants have not established but-for materiality because they have not established that Dr. Oh and Dr. Park should have been listed as inventors. Pre-AIA 35 U.S.C. § 102(f) speaks of inventors, not coauthors. Even if coauthors were omitted, the patent could still have been issued if those coauthors were not inventors. Defendants have not carried their burden to show that Dr. Oh and Dr. Park were coinventors and thus have not shown the patent would not have issued but for the omission.¹⁰

Defendants also allege the egregious misconduct exception should extend to inventorship issues. In support, they cite a Federal Circuit case that made no mention of

¹⁰ Defendants suggest inventorship need not be resolved to hold a patent unenforceable. But the case they cite for that proposition was decided before *Therasense*, and thus, before the Federal Circuit settled on a but for standard for materiality. See *Advanced Magnetic Closures, Inc. v. Rome Fastener Corp.*, 607 F.3d 817, 828 (Fed. Cir. 2010). As discussed, though, but for causation makes inventorship a critical part of the inquiry.

egregious misconduct and was issued before that court developed the carveout in *Therasense*, and two post-*Therasense* district court decisions. The Court disagrees that inventorship is a good candidate for a per se misconduct rule. The egregious misconduct exception still ties back to whether the misstatement was made in search of patentability where it would otherwise be in doubt. But inventorship omissions are a different kind of issue. There is no indication the invention would be unpatentable if Regents had added Dr. Oh as an inventor. Her omission would not advance their patent application. Such omission would be far from model behavior, but would be targeted at other ends, such as hoarding royalties or credit. The Federal Circuit has counseled that “enforcement of an otherwise valid patent does not injure the public merely because of misconduct, lurking somewhere in patent prosecution, that was immaterial to the patent’s issuance.” *Therasense*, 649 F.3d at 1292.

What is more, the cases that Defendants cite are about exclusion of inventors, not authors. Even if there is an egregious misconduct carveout for exclusion of inventors, Defendants do not advance sufficient facts that Dr. Oh and Dr. Park are inventors for purposes of triggering that carveout.

b. Intent to Deceive

As above, the single most reasonable inference is not to deceive. To start, it is worth noting here that the omission was not selective. It is not as if the patent prosecutor only erased Dr. Oh’s and Dr. Park’s names; Drs. Giannakis and Ma were omitted from the paper, too.

Defendants cite *Advanced Magnetic*, 607 F.3d at 832 and *Frank's Casing Crew & Rental Tools, Inc. v. PMR Techs., Ltd.*, 292 F.3d 1363, 1375–77 (Fed. Cir. 2002) to suggest inventor omission is inherent evidence of intent to deceive. Again, these cases beg the question whether Drs.' Oh and Park were "true inventors." And again, the Court will not overly credit pre-*Therasense* rules from the wild west days of inequitable conduct.

In sum, the Court will deny Defendants' Motion for Summary Judgment because Defendants have not met their heavy burden for inequitable conduct of establishing materiality or intent to deceive. And because the Court finds Defendants' inequitable conduct allegations are legally deficient, it will issue summary judgment for Regents and dismiss inequitable conduct defenses from this action.

CONCLUSION

In sum, the Court will technically grant Regents' motion for summary judgment that Ming PCT is not prior art, though it will allow Defendants' to substitute the Ming US application to make the same prior art arguments. The Court will also hold as a matter of law that the '230 patent does not violate the original patent rule. And Defendants' motions for summary judgment will be denied. Accordingly, because none of these rulings terminate the action, the case may proceed.

ORDER

Based on the foregoing, and all the files, records, and proceedings herein, **IT IS HEREBY ORDERED** that:

1. Plaintiffs' Motion for Summary Judgment (1) That the Ming Reference Is Not Prior Art and (2) That the 230 Patent Is Not Invalid Under the Original Patent Rule [Docket No. 536]¹¹ is **GRANTED in part** and **DENIED in part**;

— Granted insofar as the Ming PCT application is not prior art, but denied insofar as Defendants may substitute the Ming US application for invalidity arguments;

— Granted as to the holding that the '230 patent does not violate the original patent rule;

2. Defendants' Motion for Summary Judgment of Invalidity of the '230 Reissue Patent Based on Regents' Violation of the Original Patent Requirement [Docket No. 543]¹² is **DENIED**;
3. Defendants' Motion for Summary Judgment of Non-Infringement of U.S. Patent Nos. 7,251,768, RE45,230, 8,588,317, 8,718,185, and 8,774,309 [Docket No. 580]¹³ is **DENIED**; and

¹¹ ECF No. 14-4669, Docket No. 568; ECF No. 14-4671, Docket No. 556; ECF No. 14-4672, Docket No. 587.

¹² ECF No. 14-4669 Docket No. 574, ECF No. 14-4671 Docket No. 562; ECF No. 14-4672, Docket No. 593.

¹³ ECF No. 14-4669 Docket No. 599, ECF No. 14-4671 Docket No. 572; ECF No. 14-4672, Docket No. 628.

4. Defendants' Motion for Summary Judgment of Unenforceability of U.S. Patent Nos. 7,251,768, RE45,230, 8,588,317, 8,718,185, and 8,774,309 Based on Inequitable Conduct [Docket No. 586]¹⁴ is **DENIED**.

DATED: February 23, 2024
at Minneapolis, Minnesota.

s/John R. Tunheim
JOHN R. TUNHEIM
United States District Judge

¹⁴ ECF No. 14-4669 Docket No. 614, ECF No. 14-4671 Docket No. 574; ECF No. 14-4672, Docket No. 626.